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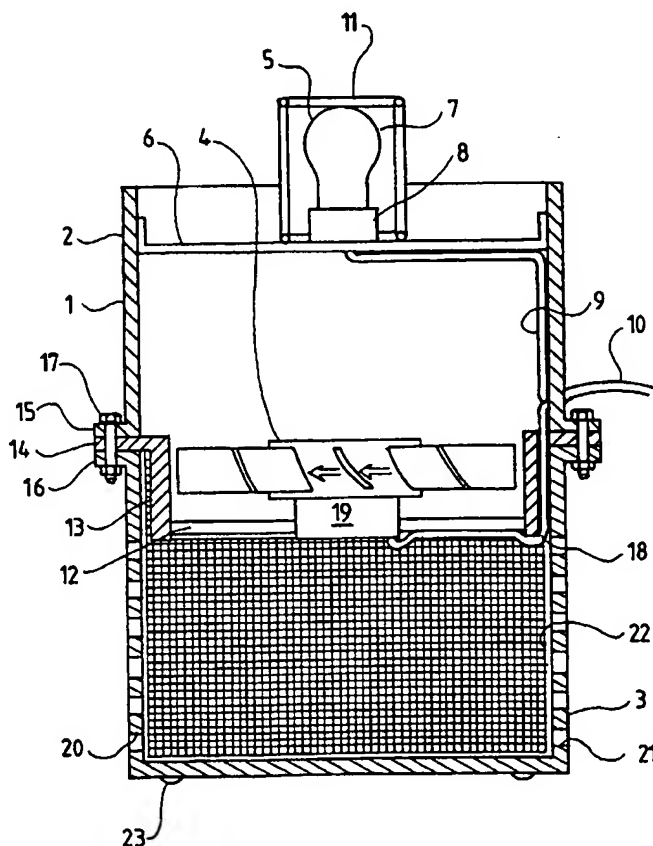
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(54) Title: LAMP WITH INSECT CATCHER



(57) Abstract: The invention provides a combination lamp and insect catcher device (1) comprising a vented chamber (3) for retaining trapped insects, a duct (2) extending outwardly of an opening in the chamber, an electrically powered fan (4) mounted in the chamber opening or in the duct, which fan when energised draws air into the chamber, and an electrically powered light source (5) that emits light in the visible range mounted at the distal end of the duct and protruding substantially clear of said duct to allow illumination of the area about the device. A shade can be provided about the light source to limit the emitted light.

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LAMP WITH INSECT CATCHER

TECHNICAL FIELD

This invention relates to the control of insects in a localised area. In particular, the invention relates to a device that can be used as an outdoor lamp but which also
5 reduces the numbers of flying insects in the vicinity of the device.

BACKGROUND ART

Flying insects are invariably encountered when carrying out activities out-of-doors. This is particularly the case when an activity requires lighting with the result that insects are attracted to the light. At best, such insects are an irritation. Beyond
10 that, insect bites can be painful and pose health risks such as insect-borne infectious diseases. Insects also pose a health risk when food is being consumed or prepared out-of-doors. Furthermore, commercial food preparation such as fruit packing requires control of insect numbers so that picked fruit does not suffer insect damage.

It is often difficult to screen outdoor areas as a method of controlling insect
15 numbers. Chemical insecticides can be used for both personal and local environment insect control but use of chemicals can in itself pose health hazards.

Electrical insect control devices are known in which flying insects are attracted to the device by a light source and then electrocuted on contacting electrodes within the device. In these devices, the lamp is used merely for attracting insects and does
20 not provide adequate general illumination. Furthermore, sparks are generated by these devices which is not desirable for use in areas where flammable substances might be present. In addition, the noise generated by the electrocution process can be disconcerting.

Insect traps are also known that utilise air flow generated by a fan to collect
25 flying insects. One such device is described in EP 0 746 977 A1 but as this device does not include a light, it only serves as an insect control means and cannot be used for lighting an outdoor area. The insect traps described in International Application No. PCT/AU96/00596 (International Publication No. WO 97/10709) and US Patent No. 5,329,725 to Donald W. Bible are similar devices that do include a light. However, in
30 both cases the light is used purely for attracting insects and does not provide general illumination.

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SUMMARY OF THE INVENTION

The object of the invention is to provide a lamp suitable for outdoor use that includes a mechanism for reducing the number of flying insects that might be attracted to the light source of the lamp.

5 According to a broad format, the invention provides a combination lamp and insect catcher device comprising:

 a vented chamber for retaining trapped insects;

 a duct extending outwardly of an opening in said chamber;

 an electrically powered fan mounted in said chamber opening or in said duct,

10 which fan when energised draws air into said chamber; and

 an electrically powered light source that emits light in the visible range mounted at the distal end of said duct and protruding substantially clear of said duct to allow illumination of the area about said device.

 It will be appreciated from the foregoing passage that the invention works on
15 the principle that flying insects when attracted to the light source will be drawn into the duct under the action of the fan and then propelled into the catcher chamber thereby reducing the number of flying insects in the vicinity of the device.

 The catcher chamber is typically a cylinder—or at least a vessel having a circular cross-section—having an open end and a closed end which forms a base for
20 the catcher. The fan can be mounted in the open end of the cylinder. Similarly, the duct is typically a cylinder having a diameter about the same as the diameter of the open end of the chamber. The chamber and duct can, however, be of any cross-sectional and/or overall shape.

 The venting of the catcher chamber is typically by way of openings in a wall or
25 walls of the chamber. To prevent escape of insects, larger sized openings are screened. Alternatively, a fine mesh basket or bag can be provided, usually inside the chamber. A removable panel can be provided in the chamber for disposal of trapped insects. Typically, insect removal is effected by separating the duct and chamber and removing insects from the later or a chamber basket if present. If the catcher includes
30 a mesh bag, insect removal can be effected by merely removing the bag. A drawstring is advantageously included at the mouth of the bag.

 As an alternative to a chamber having integral walls, the chamber can merely

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comprise a bag held in a frame. The mouth of the bag and an appropriate supporting member constitutes the mouth of the chamber in this form of the invention. The frame can include legs for supporting the device.

Chambers of devices according to the invention can include castors so that a device is easily moveable. Alternatively, devices can include a hook or the like for
5 suspending a device from an overhead support.

The fan is preferably an axial flow fan. The fan can be powered by an AC or DC supply. An AC supply is preferred.

As noted above, the duct is typically a cylinder. However, the duct can also
10 be designed to include a venturi. This can be effected by including a restriction, or neck, at the inlet of the duct, or by providing a duct with a cross-sectional area which increases from the inlet end to the outlet end. The latter form of duct is most conveniently provided in the form of a frustum of a cone.

In a preferred form of the invention, the catcher includes a closeable louvre
15 positioned between the fan and the catcher chamber. When in use, the louvre is opened so that insects can be forced into the chamber by the fan. When not in use, the louvre is closed so that the insects cannot escape from the chamber.

The light source can also be AC or DC powered but AC power is again preferred. The light source is typically an ES or BC lamp with corresponding lamp
20 holders. Using 240 volt power, lamps of 25 to 100 watt are typically used. A preferred lamp, is a 75 watt lamp.

The light source can have a protective cover or grille thereover. Devices can also have a shade over or around the light source, or a shield to limit the intensity of light emitting from a device at particular angles.

25 In addition to the light source for general illumination which also acts as an insect attractant, devices can include a further light source which acts specifically as an insect attractant. The further light source can be chosen to emit light of wavelength to which particular insects may be more responsive and does not need to be limited to wavelengths within the visible range.

30 To facilitate connection of the duct to the catcher chamber, the duct and opening in the chamber can be correspondingly flanged. The flanges can then be held in abutment by screws, bolts, clips or the like. Clips are particularly preferred for ease

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of emptying the chamber. The fan motor and light source are typically mounted to individual members extending between walls of the chamber and duct, respectively.

Devices according to the invention can be fabricated from any suitable material. Typically, a device is fabricated from a plastics or metal material. A
5 composite plastics material, such as fibreglass, can also be used to fabricate a device.

Trapped insects do not necessarily have to be killed and can be easily released back into the environment. The released insects are still a food source for animals, reptiles or birds that rely on insects for sustenance as the insects have not been chemically contaminated which is the case with use of insecticides. The
10 combination lamp and insect catcher device is thus more environmentally friendly than other methods of reducing flying insects in a particular area

Having broadly described the invention, a combination lamp and insect catcher will now be exemplified with reference to the accompanying drawings briefly described hereafter.

15 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view of a combination lamp and insect catcher according to the invention.

Figure 2 is a partial cross-sectional view at plane A-A of Figure 1.

Figure 3 is a partial cross-sectional view of yet another combination lamp and
20 insect catcher according to the invention.

Like items in the drawings are identically numbered.

BEST MODE AND OTHER MODES OF CARRYING OUT THE INVENTION

Referring now to Figure 1, there is shown device 1 comprising a cylindrical duct 2 and a cylindrical chamber 3 not visible in the figure. The open end of chamber
25 3 has an AC powered 240 volt fan 4 mounted therein while the inlet of duct 2 has a light source 5 mounted therein.

The components and configuration of the device can be more clearly seen in the partial cross-sectional view presented in Figure 2. Specifically, light source 5 can be seen mounted at the inlet of duct 2 via a member 6 extending between inside
30 surfaces of the cylindrical wall of the duct. (Member 6 is also visible in Figure 1). Light source 5 comprises a 75 watt 240 volt BC lamp 7 and a lamp holder 8. A power lead 9 runs from lamp holder 8 to a junction box, not shown in the drawings, which has a

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power lead partially shown at 10 which can be connected to an AC supply. A safety cage 11 is provided over light source 5, which safety cage is releasably secured to member 6. Power lead 9 is also secured to member 6 and the inside surface of duct 2 by clips not shown in the drawings.

5 Fan 4 is similarly mounted via a member 12 which extends internally of a lipped annulus 13. Lip 14 of annulus 13 fits between flanges 15 and 16 of duct 2 and chamber 3, respectively, whereby the whole assembly is held together by nuts and bolts, one such combination being indicated at 17. Alternatively, over centre clips can be used for ease of separating duct 2 and chamber 3 for removal of insects. A power
10 lead 18 extends from the motor 19 of fan 4 to the above-mentioned junction box.

Chamber 3 has a plurality of holes drilled through the cylindrical wall thereof. However, it will be appreciated that slots can be used rather than holes or the entire chamber can be in the form of a grill. These holes are arranged in vertical rows equally spaced about the chamber. A hole of two such vertical rows is indicated at 20
15 and 21. Chamber 3 includes an internal fine mesh basket 22 to prevent escape of insects drawn into the chamber. Chamber 3 can also have feet fitted to the bottom thereof, one such foot being indicated at 23. Alternatively, castors can be used to allow the device to be easily moved.

Duct 2 and chamber 3 have internal diameters of about 300 mm and wall
20 thicknesses of about 11 mm. Duct 2 is about 200 mm high and chamber 3 is about 300 mm high. The top of light source 5 extends about 90 mm above the edge of duct 2.

Duct 2 and chamber 3 are fabricated from a plastics material such as moulded polythene, polypropylene or PVC. Members 6 and 12 and basket 22 are
25 fabricated from metal or plastics materials. However, basket 22 can alternatively be fine gauze, a fabric or paper. Lamp 7 and lamp holder 8 are standard commercially available fittings while fan 4 is advantageously an Arlec™ Model No. E250 available from any hardware or electrical store.

It will be appreciated that during operation of the device, insects will be
30 attracted to light source 5. Once in the vicinity of light source 5, the draught created by fan 4 will draw the insects into basket 22 where they will be trapped. Holes in the wall of chamber 3, such as 20 and 21, vent the pressure created by the fan. Trapped

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insects in basket 22 can be disposed of by simply separating duct 2 and chamber 3.

Turning to Figure 3, there is shown insect catcher 31 which like the catcher shown in Figures 1 and 2 includes a cylindrical chamber 32 and a substantially cylindrical duct 33. Duct 33 includes an AC powered fan 34, a closeable louvre 35 and at a frustro-conical end 36 thereof a light source 37. The lower end of duct 33 is necked, as indicated at 38, about which is secured a mesh bag 39 which extends into chamber 32. A drawstring 40 is used to hold bag 39 to neck 38.

A four-sided shield 41 is positioned about light source 37. Three sides of the shield are opaque to limit light emission while the fourth side is clear to allow efficient insect attraction. Catcher 31 also includes a shade 42 about the top thereof and also about light source 37.

Other features of the catcher 31 are as detailed above for the catcher shown in Figures 1 and 2. Catcher 31 has dimensions of nominally 300 mm wide by 500 mm high.

When power is supplied to catcher 31, a solenoid opens louvre 35 and energises fan 33 and light source 37. However, a switch can be provided so that the light source alone is energised. Insects attracted to light source 37 are forced into bag 39 by fan 34. When power to the catcher is switched off, the louvre closes preventing escape of the trapped insects. To dispose of the insects, a panel is removed from vented chamber 32 and screened bag 39 is removed from the duct by releasing the drawstring 40. The bag can be temporarily closed using the drawstring prior to emptying the insects therefrom. An elastic or rubber band can be used in place of the drawstring.

It will also be appreciated that many changes can be made to the combination lamp and insect catchers as exemplified above without departing from the broad ambit and scope of the invention as defined in the claims appended hereto.

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CLAIMS

1. A combination lamp and insect catcher device comprising:
a vented chamber for retaining trapped insects;
5 a duct extending outwardly of an opening in said chamber;
an electrically powered fan mounted in said chamber opening or in said duct,
which fan when energised draws air into said chamber; and
an electrically powered light source that emits light in the visible range
mounted at the distal end of said duct and protruding substantially clear of said duct to
10 allow illumination of the area about said device.
2. The device according to claim 1, wherein said venting is by way of openings in
a wall or walls of said chamber.
3. The device according to claim 2, wherein said openings are screened.
4. The device according to claim 1, wherein said chamber comprises a mesh
15 bag supported by a frame therefor.
5. The device according to claim 4, wherein said chamber frame includes legs
for supporting said device.
6. The device according to claim 1, wherein said device further includes a mesh
basket or bag within said chamber for retaining said insects.
- 20 7. The device according to claim 1, wherein the inlet of said duct is of a smaller
area than the outlet thereof.
8. The device according to claim 1, wherein said chamber opening includes a
closeable louvre for retaining insects in said chamber.
9. The device according to claim 1, wherein said chamber has castors fitted to
25 the base thereof.
10. The device according to claim 1, which further includes a protective cover or
grille over said light source.
11. The device according to claim 1, which further includes a shade over or
around said light source.
- 30 12. The device according to claim 1, which further includes an additional light
source that emits light at a wavelength to which particular insect species are
responsive.

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13. The device according to claim 1, wherein said light source and fan are AC powered.
14. A combination lamp and insect catcher device comprising:
- a chamber of generally circular cross-section having an open end and a
 - 5 closed end, and a plurality of openings in a wall of said chamber;
 - an electrically powered fan mounted in said open end of said chamber;
 - a mesh bag for retaining insects drawn into said chamber by an air flow created by said fan;
 - a duct of generally circular cross section fixed to said open end of said
 - 10 chamber; and
 - an electrically powered light source that emits light in the visible range mounted at the inlet of said duct and extending substantially clear of said duct to illuminate the area about said device; wherein,
 - said duct and fan are demountable for removal of said bag for disposal of
 - 15 entrapped insects.

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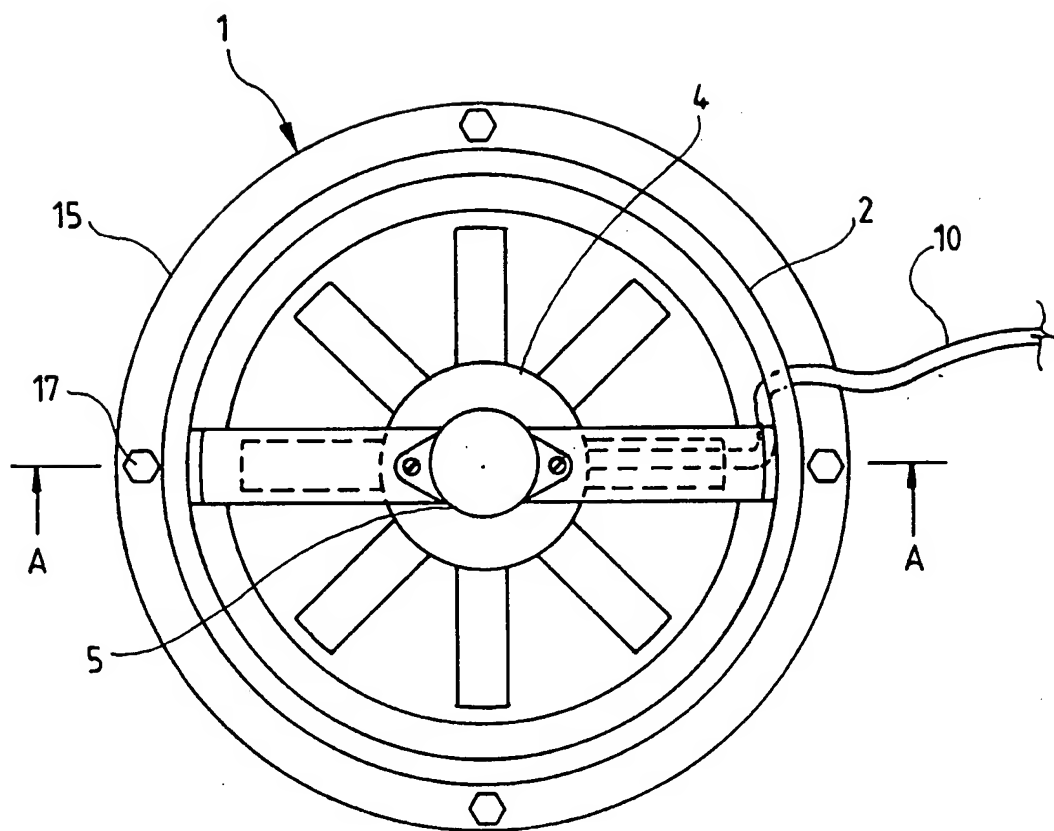


Fig.1

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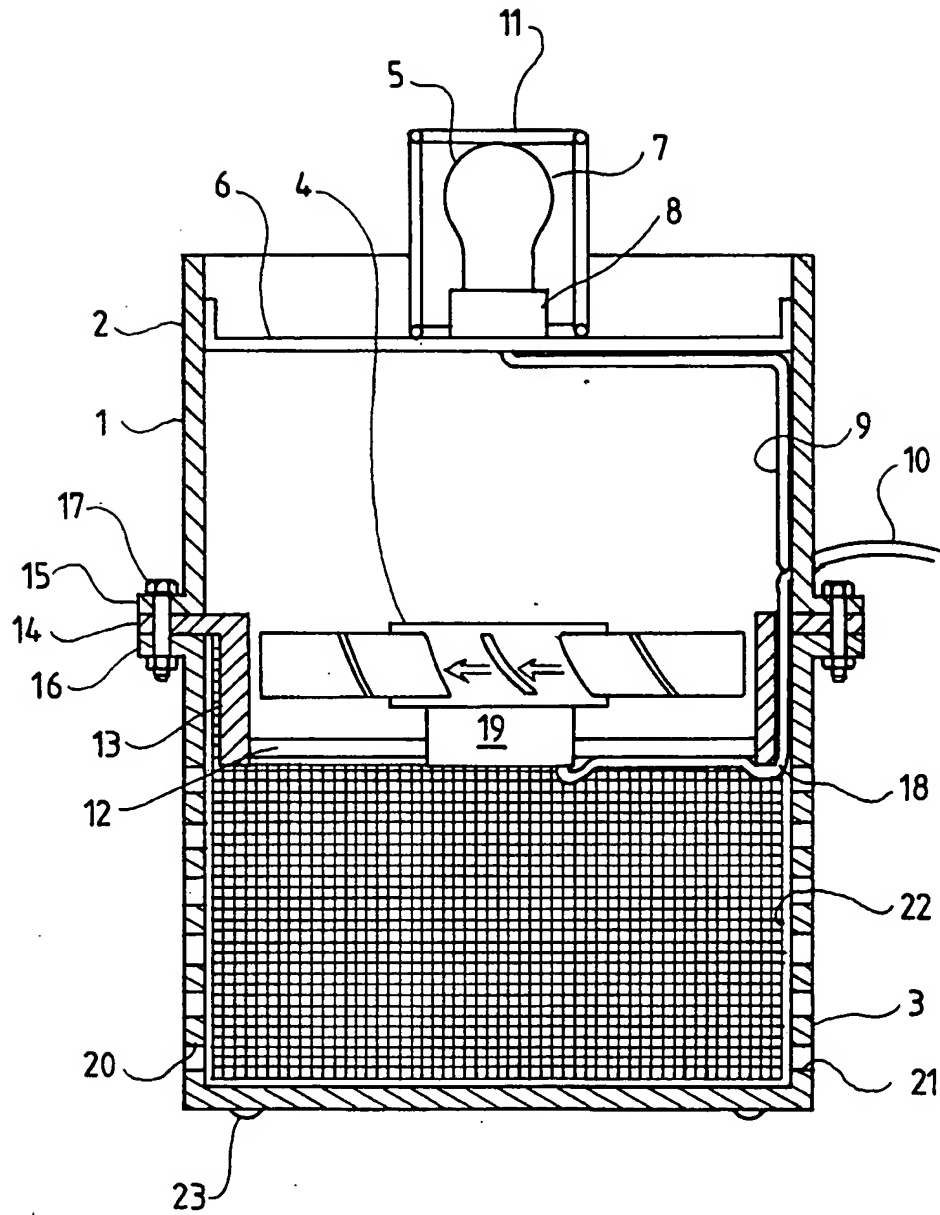


Fig. 2

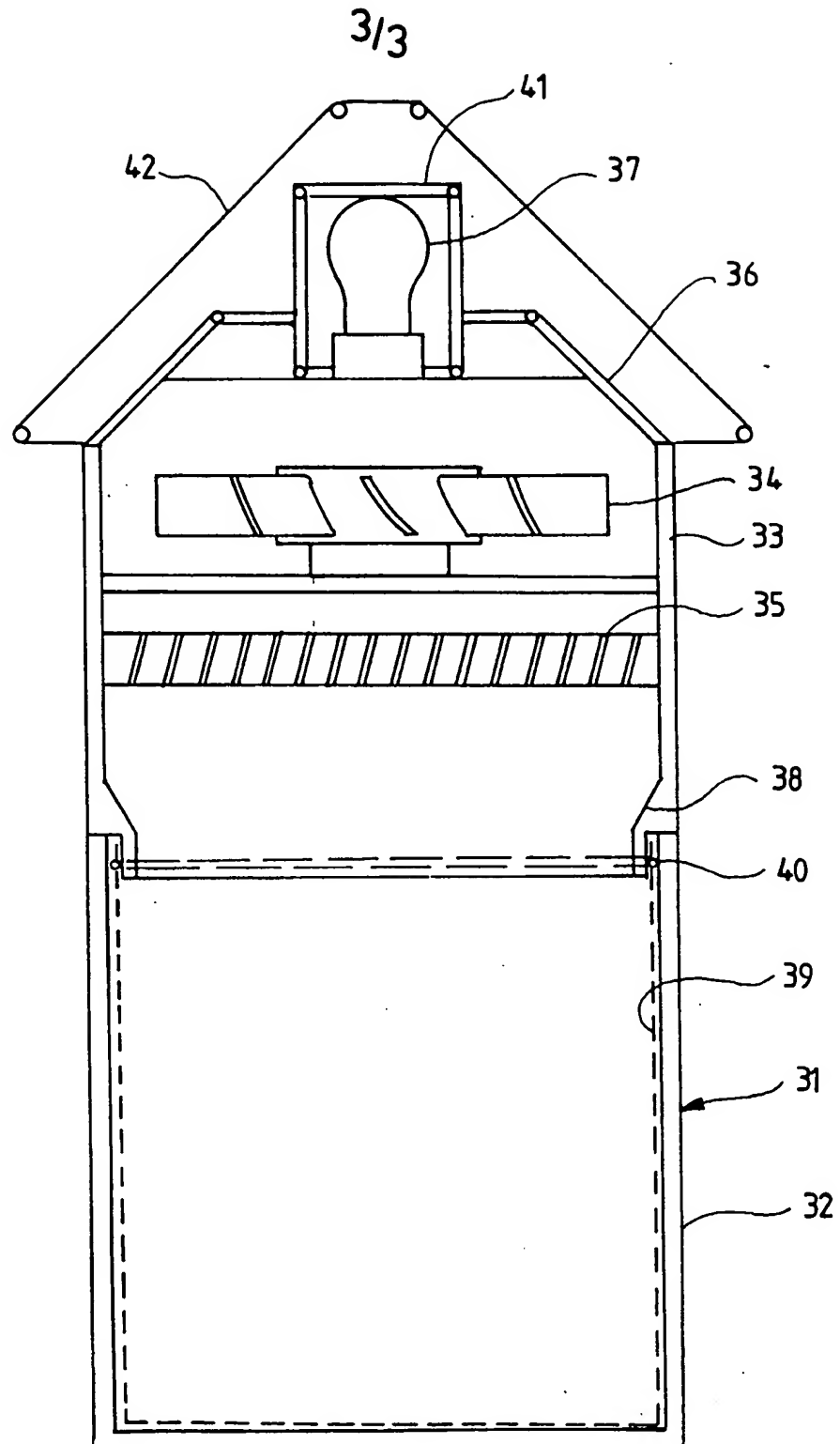


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU00/00785

A. CLASSIFICATION OF SUBJECT MATTERInt. Cl. ⁷: A01M 1/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A01M 1/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU: IPC AS ABOVE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI and key words

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4282673 A (FOCKS et al.) 11 August 1981 Whole document	1-8, 10-11, 14
X	Derwent Abstract Accession No. 92-430932/52, Class P14, NL 9100818 A (HENDRIKS) 1 December 1992 Abstract and drawing	1-4, 6-8, 10-11, 13-14
X	CA 2099389 A (BIELA) 31 December 1994 Whole document	1-6, 10-11, 13



Further documents are listed in the continuation of Box C



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20 July 2000

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International application No.

PCT/AU00/00785

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CA 2073163 A (BIELA) 7 January 1994 Whole document	1-4, 6, 10-11, 13
X	US 5157865 A (CHANG) 27 October 1992 Whole document	1-5, 8, 10-11, 13
X	US 5014460 A (PATTI et al.) 14 May 1991 Whole document	1-2, 5, 7, 10-11, 13
X	AU 20156/88 A (JONES) 8 September 1988 Whole document	1-2, 5, 7, 10-11, 13